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28 April 1978

TRANSLATIONS ON TELECOMMUNICATIONS POLICY,
RESEARCH AND DEVELOPMENT

No. 35

WORLD

WIDE

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ITALY

DESIGN CRITERIA OF TERRESTRIAL TELECOMMUNICATION SYSTEMS ABOVE 10 GHz

Rome NOTE, RECENSIONI E NOTIZIE in Italian Jan-Apr 75 pp 33-69.

[Article by F. Fedi, R. Koch, B. Peroni]

[Text] 1. Introduction

In the autumn of 1967 the Director of the Head Office of the Postal-Telegraph Agency (ISPT) asked the Ugo Bordonni Foundation (FUB) to look into the possibility of inaugurating studies in the field of higher frequency communication systems.

The Bordonni proposed studies on the conditions for free propagation of electromagnetic waves at frequencies above 10 gigahertz and on the influence exerted by atmospheric precipitation on their space-time structure.

The ISPT looked with favor on this proposal and included this subject on the list of those presented by the Italian delegation at meetings of the Telecommunications experts groups of the European Community, so as to formulate research projects at the Pan-European level. This proposal awakened a lively interest in other European countries and was included among the subjects to be considered for European cooperation in January 1968.

Following up these developments, the FUB, after concluding a series of preliminary studies, elaborated and presented to the ISPT in early 1969 a complete program of studies on the above-mentioned subject, envisioned as taking three years to complete.

The ISPT, allowing for the importance of the subject, felt it would be good to involve the Higher Council of Telecommunication Engineers (CSTT), to whom the program was presented in February 1969.

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WORLDWIDE AFFAIRS

JORDAN, JAPAN SIGN AGREEMENT FOR RELAY STATION

Amman JORDAN TIMES in English 21 Mar 78 p 2 JN

[Text] Amman, March 20 (JNA)--The Jordanian Government and Japan's Nippon Electric Co. signed an agreement here today under which the firm will construct a new satellite relay station in Jordan costing \$9.5 million, and will introduce improvements to the present station at Al-Baq'ah.

The project will put Jordan in direct touch with Atlantic and Indian Ocean countries, making it a central link in world communications.

Minister of Communication 'Abd al-Ra'uf ar-Rawabidah and the director of Jordan's Telecommunication Corporation, Mr Muhammad Isma'il, signed the agreement on behalf of Jordan.

In a statement after the signature, Mr Isma'il said the new ground satellite relay station will put Jordan in touch with several communication satellites orbiting the earth, including a stationary-orbit satellite over the Atlantic Ocean. The improvements on the existing Al-Baq'ah station will put Jordan in touch with the stationary-orbit communications satellite over the Indian Ocean. This, he said, would make Jordan able to communicate with both Atlantic and Indian Ocean countries, providing telephone and telex links and other services.

He expressed the hope that the new station will start operations seventeen months from now. According to the agreement, construction costs will be paid over a period of eight years.

CSO: 5500

WORLDWIDE AFFAIRS

PRC WANTS TO USE FRG COMMUNICATIONS SATELLITE

Hamburg DPA in German 1118 GMT 5 Apr 78 LD

[Text] Bonn--The PRC wants to use one of the German-French "Symphony" space communications satellites for its experimental telephone communications and to transmit television programs within the country. This is one of the topics to be discussed by a German delegation of experts which, according to the Research Ministry in Bonn on Wednesday, is now visiting Peking. The delegation includes representatives of the ministry, the Symphony secretariat as well as of the German Research and Experimental Center for Air and Space Travel and the space travel and electrical engineering industries.

In this connection the Research Ministry announced that the Chinese would use the "Symphony A" satellite, which is already being used by India, Iran and will shortly be used by Indonesia as well. This visit by the German delegation, which will also visit several satellite earth stations developed by the PRC, is also aimed at preparing for the scheduled fall visit to Bonn by PRC Vice Premier Fang I, minister in charge of State Science and Technology Commission.

CSO: 5500

WORLDWIDE AFFAIRS

CUBA, POLAND ESTABLISH DIRECT TELEPHONE LINK

Havana Domestic Service in Spanish 2033 GMT 31 Mar 78 FL

[Text] With a telephone conversation between Pedro Guelmes, PCC Central Committee member and Cuban communications minister and Professor and Engineer Edward Kowalczyk, Polish communications minister, the [telephone] link which joins the two countries was officially inaugurated today. In the telephone conversation, the Cuban communications minister stated that today is a special day for the two countries because for the first time Cuba has had a direct link with Poland. He also stated that the new telephone link between Cuba and Poland will permit communication with other countries, since to date this has only been possible through the Intersputnik system, which he indicated works very well.

Also in on the telephone line inauguration were Cuban First Vice Minister of Communications Rene Hernandez (Cartalla) and Polish Ambassador Ryszard Majchrzak.

In a brief meeting with the press, engineer Salvador Gutierrez, national director of radio of the Cuban Communications Ministry, stated that with this inauguration of the telephone link between Cuba and Poland there are now four such lines with the socialist camp. He added that the achievement was the result of an agreement made by the Intersputnik system administrative council which planned the telephone circuit between Cuba and Poland for this year. For his part, Eng Felix Santiago, director of Cuban International Telecommunications, said that a telephone call between Havana and Warsaw will cost 12.54 pesos for 3 minutes. To make the call, one needs to dial 09 in Havana City and 00 in the interior of the country.

CSO: 5500

CUBA PARTICIPATES IN USSR COSMIC RESEARCH

Havana CUBA INTERNACIONAL in Spanish Feb 78 pp 44-47

[Exclusive report by Professor Jose Altshuler, Dr. Sc., chairman of the Intercosmos Committee of Cuba: "The Cosmos Also Interests Us"; passages enclosed in slantlines printed in italics]

[Text] Professor Jose Altshuler, a distinguished Cuban scientist, chairman of the Intercosmos Committee and deputy director of the ACC [Cuban Academy of Sciences], has written this exclusive report explaining some Cuban achievements and prospects in research on outer space and its use for peaceful objectives.

Many epoch-making events have occurred in our century. At the same time that we have just celebrated the 60th anniversary of the Great October Revolution--beginning of an unparalleled stage in the history of human society--we realize that we have already spent 35 years living dangerously in the "nuclear age" and between 20 and 30 years immersed in the "scientific-technical revolution."

The "cosmic age" was inaugurated 2 decades ago when the Soviet Union put the first man-made earth satellite, /Sputnik 1/, into orbit on 4 October 1957. Barely 20 years after that extraordinary event, man has already been able to enter cosmic space and visit the moon while automatic planetary stations have been able to explore several planets in the solar system in various ways. Without doubt, progress has been rapid in this unique field which only a few years ago was still comfortably part of the most daring science fiction.

The year 1957 marked the beginning of the tasks of the /International Geophysical Year/ and constituted an appropriate framework for the beginning of the "cosmic age." Nationally, a hard and heroic fight of the people was taking place at that time in our cities and mountains which each day claimed its quota of priceless lives. In general, it was not the most appropriate time for our people to be seriously concerned about the cosmos.



1
Profesor José
Altshuler,
destacada figura

Professor Jose Altshuler, distinguished Cuban scientist, author of this article.

Finally, in 1959, the revolution triumphed in Cuba and the establishment of fraternal relations with the socialist bloc became reality. Among other fundamental benefits for our country, this would soon be translated into a very important stimulus for national scientific development which had remained almost totally stagnant and even, in many cases, had regressed under the neocolonial republic.

International Collaboration

The first systematic visual observations of satellites were made at our ACC with Soviet equipment and advisers in 1964.

In 1965 the USSR officially offered to share the experience that it had accumulated in research on outer space with other socialist countries in order to develop collaboration in that field. These ideas became concrete in 1967 when what would later be known as the /Inter-cosmos Program/ in which nine countries including our own participate was created.

With the technical and material support of the USSR, a system designed to receive radio signals transmitted by artificial satellites in order to obtain data for the study of the upper atmosphere was installed in the IGA [Institute of Geophysics and Astronomy] of the ACC in 1966. With the same help in the same year two special cameras designed to track satellites--one installed in Havana and the other in Santiago de Cuba--came into use.

The creation of the /Intercosmos Program/ gave Cuba the opportunity to actively participate in cosmic research in spite of the limitations of our material equipment as well as our scientific personnel.

At the beginning it was decided that the tasks included in this program would have to be divided among four work groups: physics,



Field spectrometer designed and constructed by Cuban and Bulgarian technicians, an effective aid in the preliminary work of teledetection of the earth.

meteorology, communications and biology and medicine. In 1975 the advantage of adding one on teledetection of the earth through aerospace means became evident. With the passage of years, Cuban participation in the mentioned groups has increased as a result of the continual increase in the number of graduates of higher education and the improvement of the organization of science and technology at the national level. Nevertheless, our participation in the program is still very modest.

Meteorology and Geophysics

Direct information transmitted by meteorological satellites is received daily at the Institute of Meteorology of our ACC. It is used

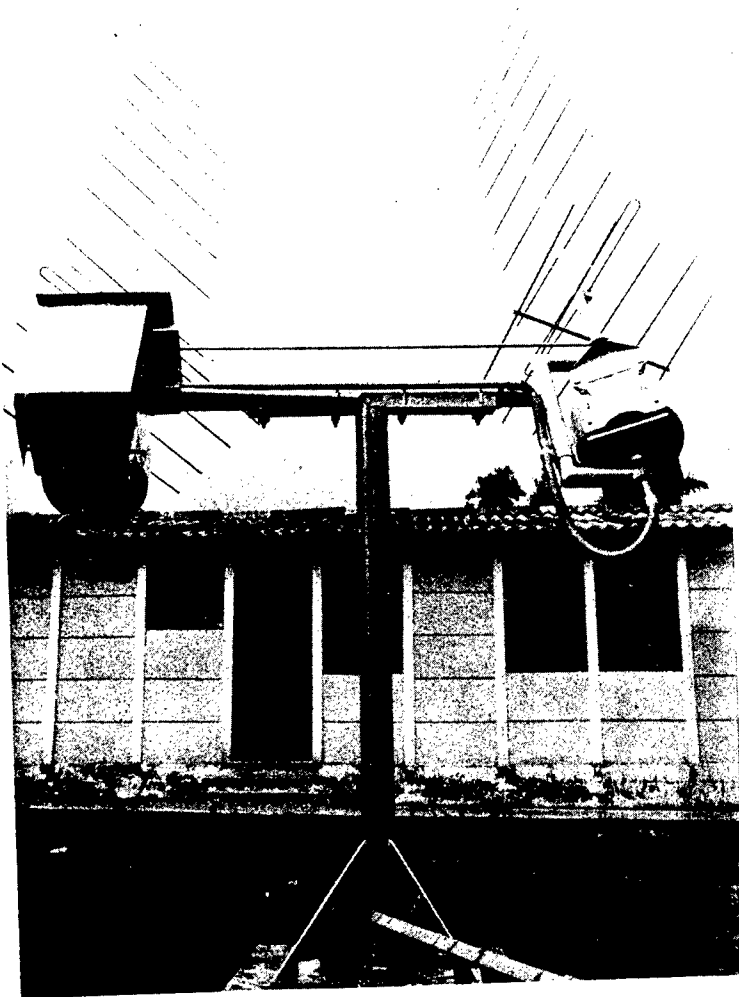
not only to make weather forecasts but also for research. Some of this is part of the list of problems that have to be solved with international participation within the framework of /Intercosmos/.

The IGA of the ACC does research on the ionosphere (the upper layer of the atmosphere which reflects shortwaves which originate on earth back down to earth) using signals from artificial satellites. A concrete example in this line of work is the measurement of the so-called "Faraday effect" that we have been doing with the GDR since 1974.

The collaboration of Czechoslovakia, the USSR, Poland, the GDR, Hungary and Cuba in the work group on cosmic physics made it possible for the IGA to receive a laser-beam radar station which was installed in Santiago de Cuba in the middle of 1977. Its basic objective is to make high precision geodesic measurements with the aid of man-made satellites. As part of the international network of similar stations created by /Intercosmos/, it will contribute to knowledge about the shape and size of the earth with extraordinary precision, a matter of great interest to the earth sciences. Also through geodesic satellites and stations like this, it is possible to increase the quality of triangulation of the country significantly and with great speed and economy. Finally it is necessary to add that the basic responsibility for maintaining and operating the station belongs to young Cuban scientists; they have received training in Czechoslovakia and other socialist countries.



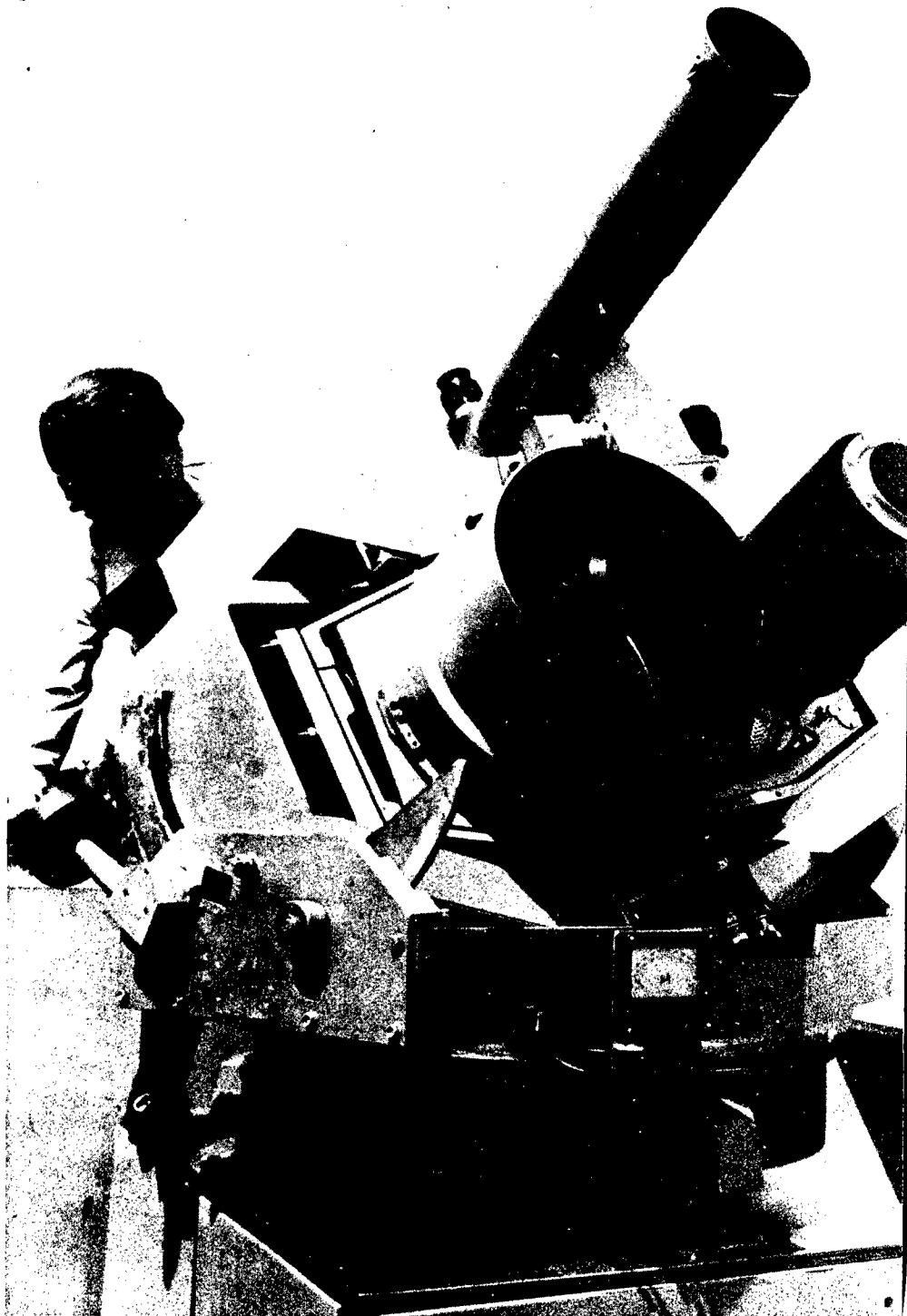
Partial view of the equipment of the unified telemetric system station installed in Cuba.



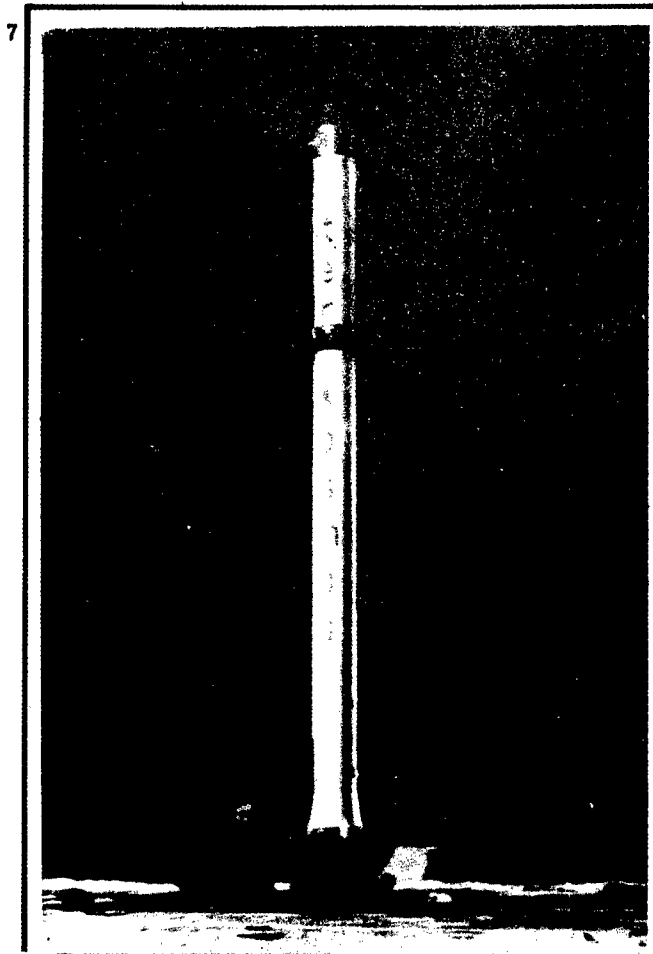
Signals from the stationary satellites, subjected to the Faraday effect when passing through the ionosphere, are attracted by a polarimeter.

Telemetry, Communications and Teledetection

At present 17 satellites have been put into orbit by the /Intercosmos Program/ plus 5 meteorological sounding rockets [cohetes estratosfericos]. These represent dozens of experiments with their corresponding input of data that the scientific collectives of the different countries involved in these experiments receive.



View of the laser-beam radar installed in Santiago de Cuba to make geodesic measurements with the aid of artificial satellites.



Launching rocket of a satellite of the Intercosmos series.

collaborate in the experiment. All this gives the Cuban scientific workers the opportunity to realize modern studies of the upper atmosphere, the magnetic field, the sun, the natural resources of the earth, etc.

Since Cuba is an insular country which means it is very important to have insured communication with other continents, it is not unusual that our Ministry of Communications has been the organization that from the beginning has concerned itself with coordinating the national work related to the cosmos. The specialists of that ministry are those who are most interested in the research and the use of outer space for the development of telecommunications. The most important practical result achieved in this field until now is the /Caribe/ land station that is an integral part of the international network of cosmic communications of the /Intersputnik/ system. It is about 40 kilometers from the center of the capital. Inaugurated at the end of 1973, it is an effective transmitting and receiving station with equipment designed and constructed in the USSR. It communicates presently with the rest of the system through communications satellites

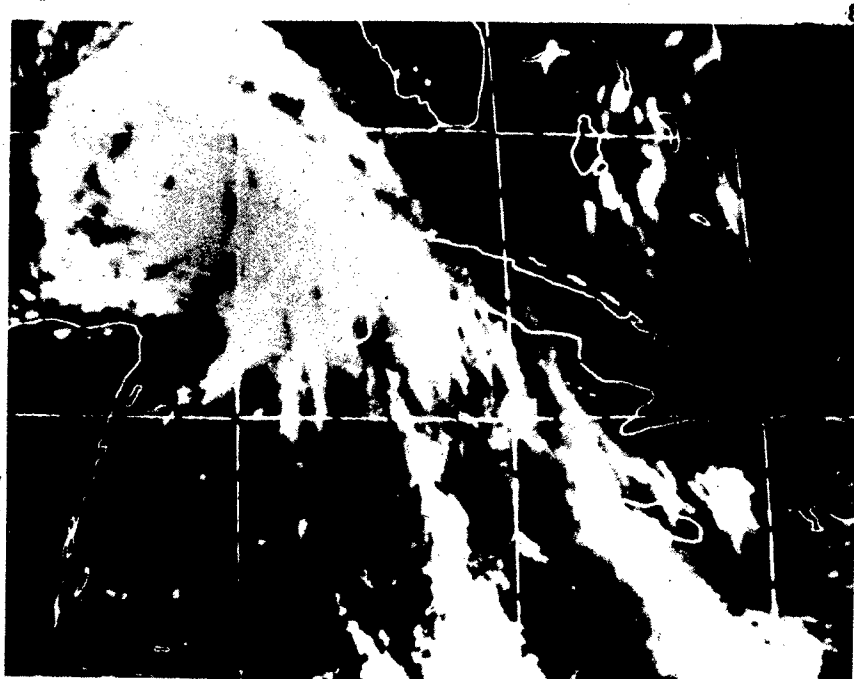
The data, of course, arrive in the form of encoded radio signals that must be received with a high degree of reliability and deciphered with a minimum of errors. With that objective the countries that participate in the program have worked collectively to establish a standardized system of transmission and reception of cosmos-earth information called /Unified Telemetric System/.

The ININTEF [Institute for Basic Technical Research] of the ACC has already received one station with that system which was installed in 1976 through the joint efforts of the USSR, the GDR, Czechoslovakia and Cuba. Starting at that date, each time the /Intercosmos/ orbital laboratories pass over our territory, we can directly receive the information that they send. This can be deciphered and used directly or transferred to the scientific collectives of other countries that

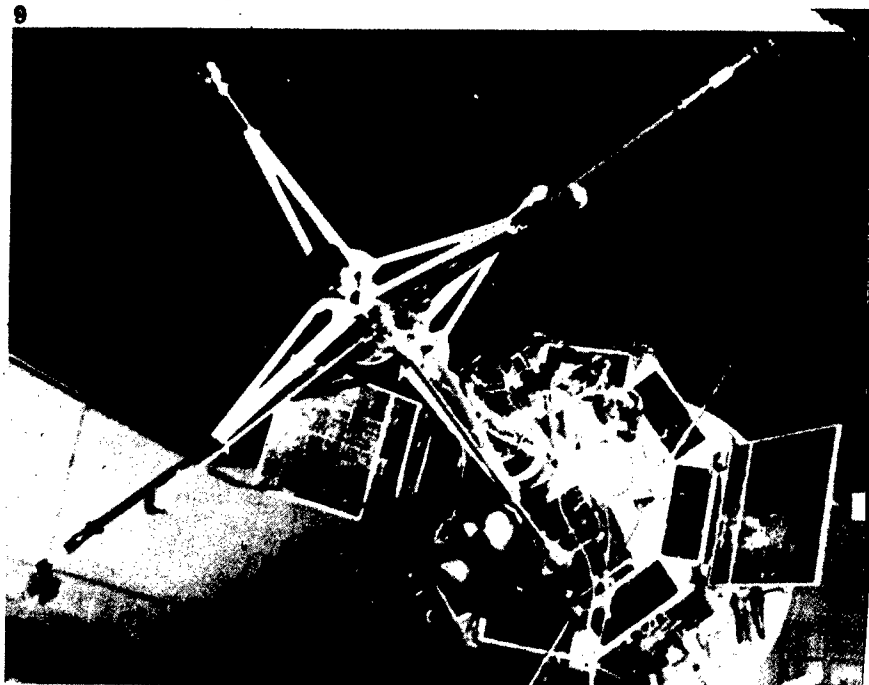


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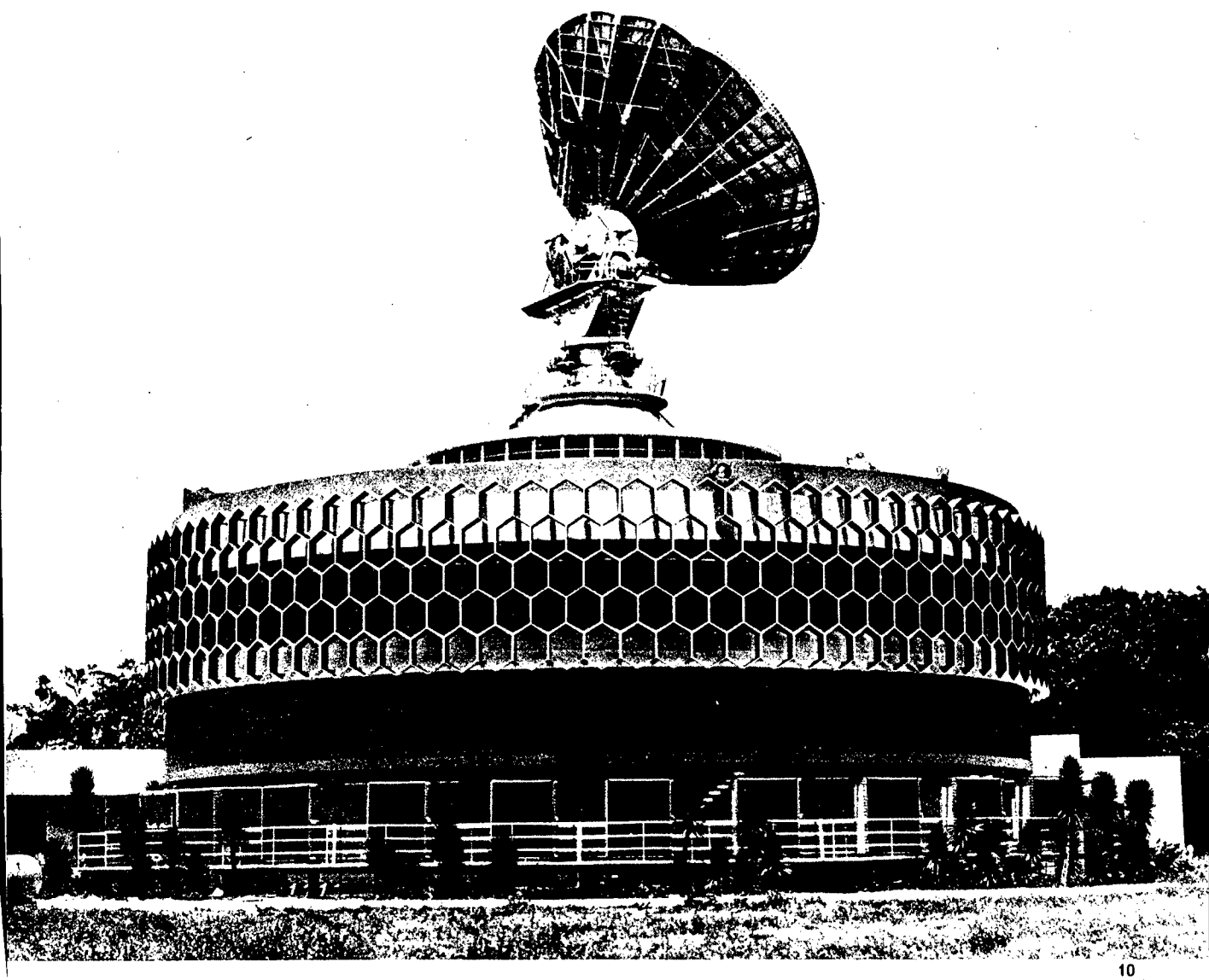
Last stage of a launching rocket of an Intercosmos satellite.



Hurricane Camille as it passes through the Gulf of Mexico. The eye of the storm is perfectly visible in this photograph taken from a meteorological satellite.



Satellite of the Intercosmos series designed for research of outer space.



The Caribe land station is part of the Intersputnik system and permits Cuba to exchange color television programs with the rest of the world and to establish highly reliable international communications.